

REMARKS

Claims 1-6, 8-19, 21-31, and 33-37 are all the claims presently pending in the application. Claims 1, 14, and 26 are amended to more clearly define the invention and claims 7, 20, and 32 are canceled. Claims 1, 14, and 26 are independent.

These amendments are made only to more particularly point out the invention for the Examiner and not for narrowing the scope of the claims or for any reason related to a statutory requirement for patentability.

Applicants also note that, notwithstanding any claim amendments herein or later during prosecution, Applicants' intent is to encompass equivalents of all claim elements.

Claims 1-9, 12-22, 25-34, and 37 stand rejected under 35 U.S.C. § 102(b) as being anticipated by the Berger et al. reference. Claims 10-11, 23-24, and 35-36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Berger et al. reference in view of the Li et al. reference.

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

An exemplary embodiment of the claimed invention, as defined by, for example, independent claim 1, is directed to a method for storing a semantic object derived from geological seismic survey data. The method includes summarizing attributes of the semantic object, indexing the summary of attributes, and storing the summary of attributes and the index of the summary of attributes. The summary of attributes includes one of a slice label, a signal strength, and a coordinate of a surveyed segment.

Conventionally geological seismic survey data has been visualized to assist geologists in tasks, such as for constructing three dimensional reservoir models. This data may be used to directly create images that may be viewed. These images may be annotated and saved. However, the amount of this seismic survey data is very large and it is very difficult to search and analyze the data in order to identify seismic regions that have geological characteristics which are interesting to geologists. Such enormous amounts of data make it very difficult for a geologist to identify features in the geology that is being visualized.

Additionally, the amount of data that is collected has so far outpaced the ability for conventional systems to store the data.

In stark contrast, the present invention provides a semantic object from geological seismic survey data, summarizes, indexes, and stores attributes of the semantic object. In this manner, the geological seismic survey data may be analyzed much more efficiently and easily.

II. THE PRIOR ART REJECTIONS

A. The Bergman et al. reference

Regarding the rejection of claims 1-9, 12-22, 25-34, and 37, the Examiner alleges that the Bergman et al. reference teaches the claimed invention. Applicants submit, however, that there are elements of the claimed invention which are neither taught nor suggested by the Bergman et al. reference.

None of the applied references teaches or suggests the features of the claimed invention including summarizing, indexing, and storing attributes of a semantic object derived from geological seismic survey data. As explained above, these features are important for efficiently and easily analyzing geological seismic survey data.

Rather, the Bergman et al. reference discloses processing data from a Formation Micro-scanner Imager (FMI) that detects variations in electrical resistivity of the sides of a borehole, as well as, from archives of petroleum well-bore data. In other words, the data that is disclosed by the Bergman et al. reference is all acquired from discrete points within bore holes, resulting in cylindrical surface (from FMI) and a one-dimensional series for log data.

In stark contrast, the present invention summarizes, indexes, and stores attributes of semantic objects that are derived from geological seismic survey data. Seismic survey data is collected and interpolated over a large volume of space by reflections of elastic waves propagating through the earth.

Geologic seismic data is the primary way in which exploration for fossil fuels is conducted. Well log and FMI data are used merely for fine-tuning the areas which are identified by the seismic data as being promising. Therefore, the present invention provides great benefits by making it possible to efficiently analyze seismic data, which has, heretofor, not been possible.

Clearly, the Bergman et al. reference does not teach or suggest summarizing, indexing, and storing attributes of semantic objects that are derived from geological seismic survey data.

Therefore, the Bergman et al. reference does not teach or suggest each and every element of the claimed invention and the Examiner is respectfully requested to withdraw this rejection of claims 1-9, 12-22, 25-34, and 37.

B. The Bergman et al. reference in view of the Li et al. reference

Regarding the rejection of claims 10-11, 23-24, and 35-36, the Examiner alleges that the Li et al. reference would have been combined with the Bergman et al. reference to form the claimed invention. Applicants submit, however, that these references would not have been combined and, even if combined, the combination would not teach or suggest each and every element of the claimed invention.

None of the applied references teaches or suggests the features of the claimed invention including summarizing, indexing, and storing attributes of a semantic object derived from geological seismic survey data. These features are important for efficiently and easily analyzing geological seismic survey data.

As explained above, the Bergman et al. reference does not teach or suggest these features.

The Li et al. reference does not remedy these deficiencies.

Rather, and in stark contrast, the Li et al. reference discloses performing similarity searches on time series objects (or segments), such as, for example, company growth patterns, product selling patterns, stock price movements, weather patterns, geological features, environmental pollution, astrophysical patterns, and the like. All of the objects that are processed by the Li et al. reference are time-domain based.

In stark contrast, the present invention summarizes indexes, and stores attributes of semantic objects that are derived from geological seismic survey data which includes space-based objects.

Further, contrary to the Examiner's allegation one of ordinary skill in the art would not have been motivated to modify the teachings of the Bergman et al. reference based upon the Li et al. reference. While the Li et al. reference discloses processing lines in data, none of the applied

references teaches or suggest that it would be advantageous to use the linear approximation methods of the Li et al. reference upon the well-bore data that is processed by the Bergman et al. reference. One of ordinary skill in the art would not have been motivated to combine the references as alleged by the Examiner.

Moreover, there is also no motivation disclosed in the applied references to apply the linear approximation methods disclosed by the Li et al. reference upon semantic objects that are derived from geological seismic survey data.

There are many, many systems in which lines are used to represent data, yet the methods disclosed by the Li et al. reference are not used. In many cases, it is not used because there is no advantage to a multiple abstraction level representation of the line in these applications because there is no requirement for structure-based queries.

Further, it is very clear that there has been a long-felt and significant need for more efficient processing of seismic data because of the significant interest and benefits in finding new sources for fossil fuel. Until the present invention, no such method for efficient processing of seismic data has been provided. Clearly, this long-felt, yet unsatisfied need indicates that it would not have been obvious to those of ordinary skill in the art.

Therefore, the Examiner is respectfully requested to withdraw the rejection of claims 1-3, 5-6, 8-11 and 14-18.

III. FORMAL MATTERS AND CONCLUSION

In view of the foregoing amendments and remarks, Applicants respectfully submit that claims 1-6, 8-19, 21-31, and 33-37, all the claims presently pending in the Application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the Application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

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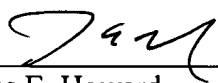
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The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Assignee's Deposit Account No. 50-0510.

Respectfully Submitted,

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